

Presumed knowledge

General

Students are not required to be familiar with all the topics listed as presumed knowledge (PK) **before** they start this course. However, they should be familiar with these topics before they take the **examinations**, because questions assume knowledge of them. Teachers must therefore ensure that any topics included in PK that are unknown to their students at the start of the course are included at an early stage.

Students must be familiar with SI (*Système International*) units of length, mass and time, and their derived units.

Topics

Number and algebra

Basic use of the four operations of arithmetic, using integers, decimals and simple fractions, including order of operations.

- *Examples:* $2(3 + 4 \times 7) = 62$; $2 \times 3 + 4 \times 7 = 34$.

Prime numbers, factors and multiples.

Simple applications of ratio, percentage and proportion.

Basic manipulation of simple algebraic expressions including factorization and expansion.

- *Examples:* $ab + ac = a(b + c)$; $(x + 1)(x + 2) = x^2 + 3x + 2$.

Rearranging formulae.

- *Example:* $A = \frac{1}{2}bh \Rightarrow h = \frac{2A}{b}$.

Evaluating formulae by substitution.

- *Example:* If $x = -3$, then $x^2 - 2x + 3 = 18$.

Solving linear equations in one variable.

- *Examples:* $3(x + 6) - 4(x - 1) = 0$; $\frac{6x}{5} + 4 = 7$.

Solving systems of linear equations in two variables.

- *Example:* $3x + 4y = 13$, $\frac{1}{3}x - 2y = -1$.

Evaluating exponential expressions with integer values.

- *Examples:* $a^b, b \in \mathbb{Z}$; $2^{-4} = \frac{1}{16}$.

Order relations $<$, \leq , $>$, \geq and their properties.

Intervals on the real number line.

- *Example:* $2 < x \leq 5, x \in \mathbb{R}$.

Geometry and trigonometry

Basic geometric concepts: point, line, plane, angle.

Simple two-dimensional shapes and their properties, including perimeters and areas of circles, triangles, quadrilaterals and compound shapes.

The (x, y) coordinate plane.

Sine, cosine and tangent of acute angles.

Pythagoras' theorem.

Statistics

The collection of data and its representation in bar charts, pie charts and pictograms.

Financial mathematics

Basic use of commonly accepted world currencies.

- *Examples:* Swiss franc (CHF); United States dollar (US\$); British pound sterling (UK£); euro (€); Japanese yen (JPY); Australian dollar (AUD).

